Is Deleting the Digital Rectal Examination a Good Idea?

MARK A. SUTTON; ROBERT P. GIBBONS, MD; *and* ROY J. CORREA, Jr, MD, *Seattle, Washington*

Many groups have taken the position that the digital rectal examination should be discontinued as part of the annual screening physical examination. We examined the effects of not doing a digital rectal examination on the early diagnosis of prostate cancer. The average time since a previous rectal examination increased as the stage of cancer increased. The digital rectal examination proved to be a relatively insensitive test, with 40% of stage D cancers being detected initially within 12 months of the most recent examination. Nevertheless, an annual digital rectal examination did detect a greater percentage of lower stage (and thus more localized and potentially curable) cancers when repeated within 12 months. When the last rectal examination was more than 24 months previous, cancers detected were more likely to be advanced.

Without a digital rectal examination, patients would have their disease detected only by the presence of symptoms. When it was done because of symptoms, 81% of our patients had stage D cancers compared with 32% of stage B and 38% of stage C patients. Without the routine use of this examination, patients with prostate cancer would be more likely to have higher stage and less potentially curable lesions at the time of diagnosis. We conclude that the digital rectal examination remains an important part of routine annual physical examinations.

(Sutton MA, Gibbons RP, Correa RJ Jr: Is deleting the digital rectal examination a good idea? West J Med 1991 Jul; 155:43-46)

Carcinoma of the prostate is a disease rarely seen in men younger than 45 years of age. After that age, however, the incidence of the disease increases until possibly half or more of the male population over the age of 70 is affected.[1] Numerous autopsy studies of men over age 40 who have died of various causes reveal that more than 30% have unsuspected prostate cancer.[2,3] One autopsy report found 10% of men between the ages of 50 and 59 to have this cancer, with the incidence rising to 40% to 50% in men older than 70 years.[4] Therefore, prostate cancer is a prevalent histologic finding at autopsy.

Despite this high incidence, most of these cancers have proved to be of no clinical significance. In one autopsy series, this subclinical rate of disease was 95%.[4] In fact, for every patient who dies of prostate cancer, 380 remain asymptomatic and have unsuspected histologic cancer detected at autopsy.[5] With the aging male population, however, clinical disease is being detected in an increasing number of patients. It is estimated that this year in the United States, more than 106,000 new cases of adenocarcinoma of the prostate will be diagnosed and more than 30,000 deaths will occur.[6] In 1990, prostate cancer was the second most common cause of death from cancer for men.[6]

Definitive therapeutic approaches to treat prostate cancer currently include surgical and radiation therapy. These have been shown to be most effective in patients with low-stage (localized) cancers.[7,8] Therefore, if carcinoma of the prostate is detected and definitive treatment is begun early, fewer deaths should occur.

Unfortunately, tests to detect early prostate cancer are limited, with only three currently available. One is transrectal ultrasonography, but this imaging study is new and is still undergoing performance testing for sensitivity and specificity. Early evidence suggests a positive predictive value of 31%, with the large number of false-positive tests caused by similar sonographic appearance between prostatic carcinoma and benign conditions such as prostatitis and prostatic infarction.[9] The second test is for serum tumor markers such as prostatic acid phosphatase and prostate-specific antigen. Prostatic acid phosphatase measurements have moderate sensitivity (20% to 45%) while the prostrate-specific antigen test is highly sensitive but lacks specificity (38% to 56%).[10-12] Therefore, transrectal ultrasonography and the tests for serum tumor markers have not been endorsed by the scientific medical community as efficient, dependable, and cost-effective screening tests for prostate cancer.

The third test is the oldest: digital rectal examination (DRE). Championed in the early 1900s by Young[13] and later by Kimbrough,[14] this physical examination has recently come under discussion as a reliable early detection technique. The sensitivity of DRE is limited because the cancer may not have a different "feel" from the surrounding benign tissue or may be beyond the reach of the examining finger.[15-17] One study of asymptomatic men found the sensitivity of DRE to be only 33%.[18] Others place the sensitivity as low as 2% to 9%.[19] The DRE also has limited specificity, producing a large proportion of false-positive results. Several studies of asymptomatic men found that only 26% to 34% of men with a suspicious finding on DRE actually had histologic evidence of cancer on needle biopsy.[5,9,20] Other studies of men with urinary obstructive symptoms reveal that when the DRE is combined with other diagnostic tests, it has a sensitivity of 69% to 73% and a specificity of 77% to 89%.[10,21] Because of the patient population used in these studies, however, the results probably cannot be generalized to asymptomatic men. In addition, the exact sensitivity and specificity of the DRE are unknown because biopsies are rarely done on men with normal DRE results.

With these facts in mind, groups around the world have begun investigating the necessity of doing the DRE as a rou-

From the University of Washington School of Medicine (Mr Sutton) and the Section of Urology and Renal Transplantation, Virginia Mason Clinic (Drs Gibbons and Correa), Seattle, Washington.

Reprint requests to Robert P. Gibbons, MD, Virginia Mason Clinic, C7-UR, 1100 Ninth Ave, PO Box 900, Seattle, WA 98111.

tine part of the general physical examination. As these groups assembled the "adult preventive medicine examination," tests that had not been proved on the basis of a rigorous classification system were not recommended for continuation as screening tests. As a result, the DRE was not recommended for use in the annual physical examination by the Canadian Task Force[22] or by other experts.[23,24] Because of these conflicting positions, this study was done to address the following questions: How would the removal of the DRE from the routine physical examination affect the diagnosis of prostate cancers in the general population? Are serial DREs effective in detecting prostate cancer at an earlier and more successfully treatable stage?

Patients and Methodology

A retrospective, case review format was used in which 103 patients with stage B (tumor confined to the prostate), 55 patients with stage C (local spread of tumor into adjacent structures), and 52 patients with stage D (distant metastatic disease) prostate cancer were selected from the Virginia Mason Hospital (Seattle, Washington) tumor registry files. A total of 310 medical records were reviewed for information on six individual points: the patient's age at diagnosis, how the diagnosis was considered, how the diagnosis was established, the date of the last previous DRE, who did the previous DRE, and whether the same examiner did the DRE that was diagnostic for cancer (Figure 1). Any record that did not contain exact information on the above-stated points was eliminated. Only initial cancers were considered, and the records of patients with recurrent cancer were eliminated from consideration. Stage A patients were excluded because these cancers are by definition microscopic and not detectable by DRE.

Results

Stage B patients had an average age at diagnosis of 64.0 years, stage C patients averaged 70.1 years, and stage D patients averaged 74.7 years of age (Table 1). Carcinoma of the prostate was considered by either an abnormal DRE or by symptoms such as back pain, obstructive symptoms, dysuria, frequency, nocturia, urgency, hematuria, and incontinence. Approximately two thirds of the stage B and C patients (68% and 62%, respectively) were considered by abnormal DRE findings and had no symptoms, whereas 81% of the stage D patients presented with symptoms. If the diagnosis was not considered until symptoms developed, there was a significant probability that a patient had metastatic versus confined disease ($P < .01$).

All patients had their prostate cancer confirmed by needle biopsy.

The time since the previous DRE was done was divided into the percentage of cancers that occurred within the past 12 months, between 12 and 24 months, and more than 24 months (Table 2). More than half (52%) of the stage B, 65% of the stage C, and 40% of the stage D patients had their prostate cancer diagnosed within 12 months of the most recent previous DRE. On the other hand, 23% of the stage B, 25% of the stage C, and 40% of the stage D patients had their prostate cancer diagnosed after an interval of more than two years since the last DRE. If palpable evidence of prostate cancer developed more than two years after a patient's last rectal examination, there was a significant probability that he had metastatic versus confined disease ($P < .05$).

The average time since the last previous DRE was done was 21.1 months for stage B, 26.9 months for stage C, and 49.7 months for stage D patients (Table 2). Again, there was a demonstrated advantage to detecting localized stage B or C disease with more frequently performed DREs ($P < .056$).

The examiners who did the last previous DRE fell into three specific groups: urologists; primary care physicians, consisting of family physicians, general practitioners, general internists, and internal medicine subspecialists; and all others, such as surgeons and nurses. Approximately a third of the previous DREs were done by urologists (35.0%, 34.5%, and 36.5% for stages B, C, and D, respectively), with the remaining two thirds done by primary care physicians (62.1%, 61.8%, and 63.5% for stages B, C, and D, respectively). Previous DREs done by persons other than urologists and primary care physicians were rare (2.9%, 3.6%, and 0%

TABLE 1.—*Patient Population and How the Original Diagnosis Was Considered*

Cancer Stage	No.	Age, yr Average (Range)	Diagnosis Considered by Rectal Exam, %	Diagnosis Considered by Symptoms,* %
B	103	64.0 (45 to 77)	68	32
C	55	70.1 (58 to 80)	62	38
D	52	74.7 (61 to 93)	19	81

*Stage D versus stages B and C, $P < .01$.

Patient Name					
Clinic Number					
Date of Birth					
Date of Diagnosis					
Stage at Diagnosis					
? Diagnosis Considered					
? Diagnosis Established					
Date of Previous Rectal Exam					
Previous Rectal Done By?					
Same Rectal Examiner?					
Date of Treatment					
Type of Treatment					
Date of Recurrence					
Type of Recurrence					
Date of Death					
Cause of Death					

Figure 1.—The form shows the information collected on each patient from hospital records.

TABLE 2.—*Time Since the Last Previous Digital Rectal Examination (DRE) Was Done*

Cancer Stage	No.	Patients Receiving DRE in < 12 mo, %	12 mo to 24 mo, %	> 24 mo,* %	Average Time Since Last DRE, mo
B	103	52	25	23	21.1
C	55	65	9	25	26.9
D	52	40	19	40	49.7†

*Stage D versus stages B and C, $P < .05$.
†Stages B and C versus D, $P = .056$.

TABLE 3.—*Time Since Urologist Did Last Previous Digital Rectal Examination (DRE)*

Cancer Stage	Previous DREs Done by Urologist, %	Average Time Since Last Previous DRE, mo	Cancer Detected by Same Physician, %
B	35.0	14.7	77.8
C	34.5	16.6	89.5
D	36.5	28.3	57.9

TABLE 4.—*Time Since Primary Care Physician Did Last Previous Digital Rectal Examination (DRE)*

Cancer Stage	Previous DRE Done by Primary Care Physician, %	Average Time Since Last Previous DRE, mo	Cancer Detected by Same Physician, %
B	62.1	23.8	51.6
C	61.8	30.7	67.6
D	63.5	62.0	51.5

for stages B, C, and D, respectively). We compared the roles of the urologists and the primary care physicians in detecting prostate cancer by DRE (Tables 3 and 4). In all cancer stages, the average time since the last previous DRE was shorter when done by a urologist. In addition, in all stages the urologist was more likely to be the same physician who did the last previous DRE.

Discussion

An effective screening test for the early diagnosis of clinically significant prostate cancer is eagerly sought because of the poor prognosis of advanced disease and because a large percentage of the male population is reaching the at-risk age range. This has been an elusive goal, however. Mass screening of the asymptomatic male population for prostate cancer has not proved medically or economically justifiable. This is because of the high histologic prevalence of biologically insignificant tumors, the variable natural history, and the much lower incidence of clinically relevant disease. In one frequently cited study, nearly 6,000 men were examined by DRE over the course of 21 years, and in only 75 patients was prostate cancer detected.[25] Five-year survival for these patients was 77%, and it was noted that a subgroup of patients who received total prostatectomies had a higher five-year survival rate (91%) than men their age in the general population (83%). Major segments of the data were not reported, however, and the disease stages were omitted. Other studies report that screened cohorts are more likely to have more localized (stages A and B) cancer on diagnosis, but they can give no direct evidence that this leads to longer survival.[5,20,26]

Our data support the concept that periodic DRE leads to the discovery of carcinoma of the prostate in a more localized stage. Table 2 shows that the less time from the last previous DRE to the time of diagnosis, the more likely a localized, and thus more potentially curable, cancer would be detected. For instance, 77% of stage B and 74% of stage C patients had received a DRE within two years of detection, whereas 40% of stage D patients had not had a DRE within two years ($P < .05$).

Digital rectal examination alone is not a perfect test that reliably detects prostate cancer at an earlier stage—40% of our stage D cancer patients had had a screening DRE within 12 months of diagnosis. Serial DREs, however, do detect many prostate cancers when localized and thus more likely curable. The average interval between the last previous DRE and the detection of stage B cancer was less than two years but greater than four years in patients with stage D disease ($P < .056$) (Table 2). With stage B cancers being relatively curable by radical prostatectomy, stage C cancers being moderately curable by irradiation, and stage D cancers being incurable, the benefits of earlier detection are evident.

Our findings show that primary care physicians are proficient in detecting prostate cancer with the examiner-dependent DRE; 62.1% of stage B, 61.8% of stage C, and 63.5% of stage D tumors were detected by these physicians (Table 4). Urologists tend to follow their patients more closely with DRE than do primary care physicians. In addition, if the urologist was the person who did the diagnostic DRE, then he or she was more likely to be the physician who did the last previous DRE (Tables 3 and 4). Instruction in how and when to do a digital rectal examination should continue in our medical schools and primary care residency programs.

Perhaps the most critical question to be answered is, what would happen to the detection of prostate cancer if routine annual DREs were not performed? Without DREs, the only indication that prostate cancer was present would be by symptoms. Our data (Table 1) show that this is a poor method for the early detection of carcinoma of the prostate. Removing the DRE from the periodic physical examination would leave the detection of prostate cancer to only those patients with symptoms—and a strong likelihood that more advanced and incurable stage D disease was present.

In the strictest sense, the DRE has not been proved to enhance the quality and quantity of patients' lives. But this is far from being "not recommended," and omitting the DRE before other technologies are perfected is imprudent. This would reduce the early detection of not only prostate cancer but also some palpable rectal cancers, gastrointestinal disorders (by stool guaiac), neurologic disease (by sphincter tone), and other anorectal disease. The DRE is a low-cost, safe, established examination that can be done efficiently and effectively by primary care providers, is critical for the detection of early stage prostate cancers and other anorectal disease, and should remain part of the regular screening physical examination.

REFERENCES

1. Boxer RJ: Adenocarcinoma of the prostate gland. Urol Surv 1977; 27:75-94
2. Rich AR: On the frequency of occurrence of occult carcinoma of the prostate. J Urol 1935; 3:215-233
3. Franks LM: Latent carcinoma of the prostate. J Pathol Biol 1954; 68:603-615
4. Harbitz TB, Haugen OA: Histology of the prostate in elderly men: A study in an autopsy series. Acta Pathol Microbiol Scand [A] 1972; 80:756-768
5. Chodak GW, Keller P, Schoenberg H: Routine screening for prostate cancer using digital rectal examination. Prog Clin Biol Res 1988; 269:87-98
6. Silverberg E: Cancer statistics, 1990. CA—A Cancer Journal for Clinicians 1990; 40:9-26
7. Gibbons RP, Correa RJ Jr, Brannen GE, Weissman RM: Total prostatectomy for clinically localized prostate cancer: Long-term results. J Urol 1989; 141:564-566
8. Bagshaw MA: Radiotherapeutic treatment of prostatic carcinoma with pelvic node involvement. Urol Clin North Am 1984; 11:297-304
9. Lee F, Littrup PJ, Torp-Pedersen ST, et al: Prostate cancer: Comparison of transrectal US and digital rectal examination for screening. Radiology 1988; 168:389-394
10. Guinan P, Bush I, Ray V, Vieth R, Rao R, Bhatti R: The accuracy of the rectal examination in the diagnosis of prostatic carcinoma. N Engl J Med 1980; 303:499-503
11. Stamey TA, Yang N, Hay AR, McNeal JE, Freiha FS, Redwine E: Prostate-specific antigen as a serum marker for adenocarcinoma of the prostate. N Engl J Med 1987; 317:909-916
12. Huber PR, Schnell Y, Hering F, Rutishauser G: Prostate-specific antigen—Experimental and clinical observations. Scand J Urol Nephrol [Suppl] 1987; 104:33-39
13. Young HH: The early diagnosis and radical cure of carcinoma of the prostate: Being a study of 40 cases and presentation of a radical operation which was carried out in four cases. Bull Johns Hopkins Hosp 1905; 16:315
14. Kimbrough JC: Carcinoma of the prostate: Five-year followup of patients treated by radical surgery. J Urol 1956; 76:287

15. Resnick MI: Background for screening—Epidemiology and cost effectiveness. Prog Clin Biol Res 1988; 269:111-122

16. Spigelman SS, McNeal JE, Freiha FS, Stamey TA: Rectal examination in volume determination of carcinoma of the prostate: Clinical and anatomical correlations. J Urol 1986; 136:1228-1230

17. McNeal JE, Price HM, Redwine EA, Freiha FS, Stamey TA: Stage A versus stage B adenocarcinoma of the prostate: Morphological comparison and biological significance. J Urol 1988; 139:61-65

18. Vihko P, Kontturi M, Lukkarinen O, Ervasti J, Vihko R: Screening for carcinoma of the prostate—Rectal examination, and enzymatic and radioimmunologic measurements of serum acid phosphatase compared. Cancer 1985; 56:173-177

19. Stamey TA: Cancer of the prostate. Monogr Urol 1983; 4:65-132

20. Thompson IM, Ernst JJ, Gangai MP, Spence CR: Adenocarcinoma of the prostate: Results of routine urological screening. J Urol 1984; 132:690-692

21. Guinan P, Ray P, Bhatti R, Rubenstein M: An evaluation of five tests to diagnose prostate cancer. Prog Clin Biol Res 1987; 243A:551-558

22. Canadian Task Force on the Periodic Health Examination: The periodic health examination. Can Med Assoc J 1979; 121:1194-1254

23. Frame PS: A critical review of adult health maintenance—Pt 3. Prevention of cancer. J Fam Pract 1986; 22:511-520

24. Belcher DW: Adult preventive care. Univ Wash Med 1989 Winter/Spring; pp 2-7

25. Gilbertsen VA: Cancer of the prostate gland: Results of early diagnosis and therapy undertaken for cure of the disease. JAMA 1971; 215:81-84

26. Thompson IM, Rounder JB, Teague JL, Peck M, Spence CR: Impact of routine screening for adenocarcinoma of the prostate of stage distribution. J Urol 1987; 137:424-426

TO PRONOUNCE THE DEAD

Every sleep shelters a dream
and in the white days
our need
is to worry the dream from its rest
though we live as if it were not so.

Our old minds
scratched dreams on the rock
and the granite faces wept
our dreams
with every rain washing
the quiet blind bones
we kept.
By heavier rains the bones
scattered and the rock
broke
and in long seasons of burning cherry
and holly hung with thorns
we painted our faces on boxes
and stray lengths of wood
as if these were mirrors
and we might fool our inside eyes
and dream
into the day.

Day comes
like a bright ship
boiling a long white wake that veils
the dreaming water
and the rune-reading of the veil
beguiles me till death
is a daily chore
and no more:
I walk
a long avenue of empty elms
their shadows stolen by the noon.
But no rune tells this:
that even within
the high white walls of noon
green sea-dreaming dragons make their kill
and on both shores of sleep their long waves lie
as even to the oyster pearling in the dark
must come the sand unbidden on the tide.

And so the dream must wake

and dreamless sleep it leaves behind
and night among the elms.

ANTOINETTE REED©
Palo Alto, California